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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,663	09/18/2003	Ralph C. Struthers	M-15154 US	8992

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EXAMINER

CHOI, LING SIU

ART UNIT PAPER NUMBER

1713

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/666,663

Applicant(s)

STRUTHERS ET AL.

Examiner

Ling-Siu Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 31-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-30 and 51-58 is/are rejected.
- 7) ☐ Claim(s) 48-50 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)):

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

1. Claims 1-58 are now pending, wherein claims 1-30 and 48-58 are drawn to a method for storage of molecular gas; claims 31-47 are drawn to a gas storage apparatus.

***Election/Restriction***

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-30 and 48-58, drawn to a method for storage of molecular gas, classified in class 502, subclass 418.
- II. Claims 31-47, drawn to a gas storage apparatus, classified in class 429, subclass 209.

3. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another materially different apparatus such as an apparatus having metal complex for adsorption of molecular gas.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Mr. Thomas A. Blinka on August 31, 2000, a provisional election was made with traverse to prosecute the invention of claims 1-30 and 48-58. Affirmation of this election must be made by applicant in replying to this Office action. Claims 31-47 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Claim Objections***

7. Claims 4, 48-50, 55, and 57 are objected to because of the following informalities: (a) **claim 4**, line 2, "a catalyzed carbon aerogel catalyzed monolith structure" is suggested to be changed to --a catalyzed carbon aerogel monolith

structure-- in view of claim 21; (b) **claim 14**, line 3, ""formaldehyde-resorcinol (RF)" is suggested to be changed to --resorcinol-formaldehyde (RF)-- in view of claim 55; (c) **claim 48**, line 7, "carbonized aerogel is suggested to be changed to --monolith aerogel--; (d) **claim 48**, line 9, "the carbon aerogel" is suggested to be changed to --the carbonized aerogel--; (e) **claim 55**, "resorcinol-formaldehyde RF, phenolic-furfural PF" is suggested to be changed to -- resorcinol-formaldehyde (RF), phenolic-furfural (PF)--; (f) **claim 55**, line 3, the recitation "phenolic-novolak resins GP<sup>®</sup>-2018C and FurCarb<sup>®</sup>UP520" is objected because the trade marks are used to represent the resins; and (g) **claim 57**, line 2, the recitation "QUCORR<sup>®</sup>2001" is objected because the trade mark is used to represent the resin.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

**8. The following is a quotation of the second paragraph of 35 U.S.C. 112:**

**The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

9. Claims 51-58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 51, lines 5-7, the recitation "polymer sol-gel of acetates, benzoates, carbonates, chlorides epoxides, formates, hydroxides, isopropoxides, nitrates **and**

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oxalates of metal precursors" is understood as that the polymer sol-gel is prepared from the mixtures of metal precursors of acetates, benzoates, carbonates, chlorides epoxides, formates, hydroxides, isopropoxides, nitrates **and** oxalates. In view of Examples, it appears that the "and" may be replaced with --or-- or --and/or--.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

**A person shall be entitled to a patent unless –**

**(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**

11. Claims 1-12 are rejected under 35 U.S.C. 102(b) as anticipated by Struthers (US 5,366,828).

The present relates to a method for storage of molecular gas, comprising

(a)	forming an aerogel structure
(b)	forming fiber inter-engaged in the aerogel structure
(c)	sorbing a molecular gas into the aerogel structure and the fibers

(summary of claim 1)

Struthers discloses a negative anode electrode includes **microporous carbon aerogel** structures of randomly disposed **interengaged carbon fiber** in three-dimensional reticulate form and **a hydrogen absorbing metal alloy structure** throughout and conforming generally to and carried by the micro-porous carbon aerogel, wherein the hydrogen-absorbing metal includes nitrate of chromium, copper, iron, and nickel; the aerogel is obtained by the steps comprising (a) mixing resorcinol, formaldehyde, alcohol, and water in the presence of a base to form an organic sol; (b) gelling the sol by adding a salt such as sodium carbonate, sodium sulfate, potassium chloride, or ammonium nitrate; (c) adding metal nitrate to the alcogel; (d) exchanging the solution of alcohol and water within the pores of the organic alcogel; (e) supercritical drying the alcogel to form a metal-laded organic aerogel; (f) carbonizing the resulting aerogel (abstract; col. 5, lines 24-29 and 50-60; col. 6, lines 15-61). Thus, the present claims are anticipated by the disclosure of Struthers.

12. Claims 13-30 are rejected under 35 U.S.C. 102(b) as anticipated by Struthers (US 5,366,828).

The present relates to a method for storage of molecular gas, comprising

(a)	forming a polymeric structure of interconnected particles creating open cells
(b)	depositing a catalyst on the polymeric structure to form <b>catalyst island</b>
(c)	growing <b>nanosttructures</b> from the catalyst island
(d)	sorbing a molecular gas into the polymeric structure and the nanostructure

(summary of claim 13)

The disclosure of Struthers is set forth in paragraph 11 and is incorporated herein by reference. Struthers further disclose that "the metal is established of submicron sizes of metal particles fused together to establish a reticulate disordered multi-component metal alloy structure substantially conforming to the carbon aerogel by subjecting the metal-laded aerogel to temperature in excess of 600 degrees C" (claim 5). It is noted that particle having submicron size reads on nanoparticle. Thus, the present claims are anticipated by the disclosure of Struthers.

### ***Allowable Subject Matter***

13. Claims 48-58 are allowable over the closest reference: Struthers (US 5,366,828).

The disclosure of Struthers is set forth on paragraph 11 and is incorporated herein by reference. However, Struthers do not teach or fairly suggest a method to form a nanostructure laded reticulate structure comprising a step of growing **graphite nano-filaments** on the reticulate catalyzed carbon aerogel monolith structures.

### ***Conclusion***

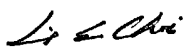
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-



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1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.

  
Ling -Siu Choi

June 25, 2004